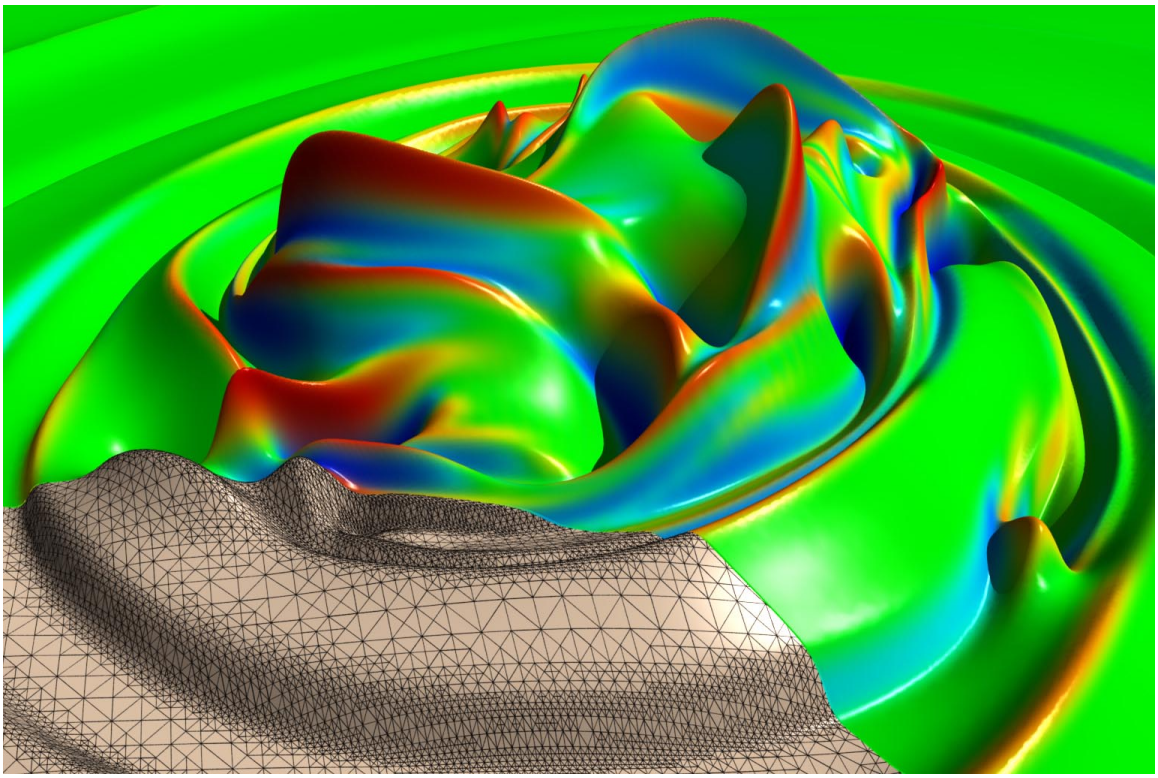
## Impulsively Driven Fluid Instabilities

Fluid instabilities play an important role in the operation of ICF capsules, particularly by their effect on mixing. Using the MIRANDA code to model a University of Arizona experiment on impulsively accelerated interfaces, LLNL uncovered a mixing mechanism driven by generation of secondary vorticity from the interaction of the complex density structure and the pressure field in the flow — basically, a centrifugal version of the Rayleigh-Taylor instability. Such simulations also serve as validation exercises for the code. A video describing this work was honored as a winning entry in the 20th Annual Gallery of Fluid Motion at the 55th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, November 24-26, 2002. It may be found at http://www.aps.org/units/dfd/index.html (follow Gallery of Fluid Motion link, then 2003 Gallery, entry S13).



This rendition of the vorticity magnitude (elevation) and vorticity production (color), from a high-resolution instability simulation of the University of Arizona experiment, uses three-dimensional visualization to allow researchers to see the two quantities simultaneously. It shows that both positive (blue) and negative (red) vorticity is being produced in existing regions of high positive vorticity (ridgetops). A portion of the visualization mesh has been made visible.

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